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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/627,461	07/25/2003	Werner M.A. Grootaert	57989US004	3246

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EXAMINER

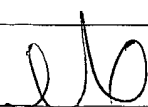
HU, HENRY S

ART UNIT	PAPER NUMBER
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1713

DATE MAILED: 07/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<p align="center">Office Action Summary</p>	Application No. 10/627,461	Applicant(s) GROOTAERT ET AL.	
	Examiner Henry S. Hu	Art Unit 1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on IDS of 10-23-2003 and 12-29-2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☒ Claim(s) 5 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>2 pages</u> . | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
6) <input type="checkbox"/> Other: _____. |
|---|---|

DETAILED ACTION

1. It is noted that the examiner has received two IDS filed on 10-20-2003 and 12-29-2003.

Claims 1-10 are pending now. An action follows.

Specification

2. The disclosure is objected to because of the following informalities:

(a) On **page 9** at line 7, phrase of "Z represents COO⁻ or SO₃⁻ M^b represents " is wrong and should be changed to "Z represents COO⁻ or SO₃⁻; M^b represents" according to traditional wording since Z and M^b each represents different things.

(b) On **page 11** at lines 21-23, the chemical structure needs to be redrawn with **three nitrogen atoms on the ring**. Otherwise, it represents a quite different compound with amino (NH) groups attached to the ring.

Appropriate corrections for (a) - (b) are required.

Claim Objections

3. Claim 5 is objected to because of the following informalities:

On **Claim 5** at lines 3-4, phrase of “**a perfluorinated monomer** selected from perfluorinated C₃-C₈ olefins, perfluorinated vinyl ethers and **mixtures** thereof” is improper. Whenever a mixture of above-mentioned monomers is included together, they are not “a monomer”. Regrouping may be needed.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 7 provides for the use of a fluoroelastomer as defined in Claim 6 or 1, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim 7 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for

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example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmiegel (US 5,973,091) in view of Beyer et al. (US 5,463,021) and Grootaert et al. (US 6,720,360 B1).

The limitation of parent Claim 1 of the present invention relates to a curable fluoroelastomer composition comprising: (A) a perfluoropolymer having one or more cure-sites selected from a halogen capable of participating in peroxide cure reaction and/or nitrile

groups; (B) **an organic peroxide and/or a compound** capable of effecting curing of the perfluoropolymer through said nitrile groups; and (C) **optionally a polyunsaturated coagent**; characterized in that the perfluoropolymer is **essentially free of ionic end groups** and wherein the total amount of **metal cations in the composition is not more than 10 µg/g** perfluoropolymer.

Other parent **Claim 10** relates to the process of making fluoropolymers of Claim 1 but with end group free or with $-CF_2Cl$ end groups. See other limitations of dependent **Claims 2-9**.

7. Regarding the limitation of parent **Claim 1**, **Schmieg** discloses the preparation of curable perfluoroelastomer compositions having an improved processability due to reduced levels of ionized or ionizable polymer endgroups (abstract, line 1-3). **Schmieg** further discloses the ionized or ionizable groups can be reduced by decarboxylation of perfluoroelastomers having carboxyl or carboxylate in the end or pendant groups (column 3, line 67 – column 4, line 4). Such fluoroelastomer compositions may additionally contain cure-site monomers such as nitrile-containing monomers (column 4, line 61 – column 5, line 25) as well as some **aromatic amines such as bis(aminophenols) and bis(aminothiophenols) with organic peroxides** for curing through nitrile groups in the polymers (column 9, line 56 – column 10, line 67).

8. However, the **Schmieg** reference is silent about using a fluoroelastomer composition having the **claimed content of metal cations, which is less than 10 µg/g polymer**. With respect to such a low limitation on metal purity, **Beyer et al.** teach that the aqueous dispersions

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obtained from polymerization of fluorinated thermoplastics can be purified. The purification involves steps such as **compressing, coagulation, and elution through ion-exchange resins** to replace metal cations with proton ions (column 1, line 47-53; abstract, line 1-4; also see examples). The advantage is a high value product with substantially no metal cations can be obtained which can be useful for directly feeding to a melt extruder.

With respect to the **claimed content of metal cations**, Grootaert et al. teach such a **Beyer purification process** can be used to obtain high purity fluoropolymers with metal ion content less than 500 ppb (column 3, line 44-51; column 1, line 12-32 and 55-57). The advantage is such pure polymers are useful in the field of electronic devices (abstract, line 4).

9. In light of the fact that Schmiegel, Beyer and Grootaert, all used curable fluoroelastomer compositions through peroxide/curative curing. Therefore, one having ordinary skill in the art would find it obvious to modify Schmiegel's polymer composition by **using a high purity polymer with reduced content of metal cations less than 500 ppb as taught by both Beyer and Grootaert**. By doing so, copolymers can be directly fed into extruder and then cured in either peroxide or aromatic amines to get the final product as useful material for electronic devices. A better and high value product can be thereby obtained.

10. Regarding **Claims 4 and 5**, other than using the nitrile-containing monomer, both perfluoro-olefin and perfluorovinyl ether are used as the two principal monomers by Schmiegel

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(column 4, line 5-19). The co-polymerization is done with ammonium persulfate as initiator in a conventional aqueous emulsion polymerization (column 6, line 8-21; column 13, line 9-28).

Regarding **Claims 8 and 10**, a redox binary system including both a sulfinate and an oxidizer can be used as initiator since the conventional free radical induced polymerization is used by the references to prepare the polymers.

Regarding **Claim 9**, Schmiegel discloses in the course of polymer purification, the polymer emulsion can be coagulated with an aqueous solution of magnesium sulfate (column 13, line 21-22).

Remaining dependent **Claims 2-3 and 6-7** are thereby rejected with above rejection for Claims 1, 4-5 and 8-10.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicants' disclosure. The following references relate to a curable fluoroelastomer composition comprising a high-purity perfluoropolymer having one or more cure-sites from a halogen or nitrile:

US Patent No. 5,677,389 to Logothetis et al. discloses the preparation of a curable perfluoroelastomer composition comprising a perfluoroelastomer having nitrile group (column 3,

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line 56 – column 4, line 20), a curative and an organic or inorganic ammonium salt, which decomposes between 120-225 °C (abstract, line 1-4). It is noted the composition can be cured through peroxides or aromatic amines (column 7, line 54 – column 8, line 67). However, Logothetis fails to teach or fairly suggests using a perfluoroelastomer having the **claimed content of metal cations as well as the reduced level of ionic end groups**.

US Patent No. 5,948,868 to Albano et al. discloses the preparation of a curable perfluoroelastomer composition comprising a perfluoroelastomer having iodine atoms (column 3, line 24-30), a curative and a bis-olefin (abstract, line 1-10). It is noted the composition can be cured through peroxides or other curing coagents (column 4, line 64 – column 5, line 18). However, Albano fails to teach or fairly suggests using a perfluoroelastomer having the **claimed content of metal cations as well as the reduced level of ionic end groups**.

12. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Henry S. Hu whose telephone number is **(571) 272-1103**. The examiner can be reached on Monday through Friday from 9:00 AM –5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The fax number for the organization where this application or proceeding is assigned is (703) 872-9306 for all regular communications.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Henry S. Hu

July 12, 2004


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SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700